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Ninety-four percent of the wetland vegetation occurs around Thermalito Afterbay. The frequent and steady fluctuations of water levels support a lower band of mixed emergent species. Waterfowl brood ponds constructed in inlets of Thermalito Afterbay support emergent vegetation along much of their shores. More detail for wetlands may be found in the report for SP-T3/5, Riparian Resources, Wetlands, and Associated Floodplains.

Aquatic/Submerged. Aquatic/submerged vegetation refers to both the free-floating plant species that occur on small ponds and slow-moving or sheltered riverine backwaters and the submerged rooted vegetation common in the deeper ponds of the OWA.

A total of 443 acres of aquatic/submerged vegetation was mapped in the project area, approximately 400 acres of which is water primrose (*Ludwigia peploides*). Water primrose occurs along the margins of ponds, waterways, and backwaters of the Feather River. Free-floating plants include mosquito fern (*Azolla* spp.), duckweed (*Lemna* spp.), and watermeal (*Wolffia* spp.), which occur primarily in the smaller ponds or canals in the OWA.

Special-Status Plant Habitats

Vernal Pools

Vernal pools are seasonally flooded depressions that are underlain by a substrate that limits drainage. They result from a combination of soil conditions, summer-dry Mediterranean climate, topography, and hydrology and support specialized plants and animals, including a large number of threatened and endangered species (SP-T2).

Approximately 49 acres of vernal pools and ephemeral swales were mapped within the project area (Figures 4.5.2-1h through 4.5.2-1j). These pools range in size from very small (less than 3 feet [ft] in diameter) to larger pools covering nearly an acre. Multiple-pool complexes range in size from 0.5 to 5 acres. The majority of pools are fairly shallow, although large deep pools also exist.

A total of 60 plant species were identified as occurring in vernal pools in the project area. Eleven of these species (18 percent) are non-native species. In comparison, 39 percent of the species found in the project area, excluding vernal pools and swales, are non-native species.

Serpentine and Gabbro

Vegetation types that occur on soils derived from serpentinitic and gabbroic rock types include sparse grassland, chaparral, and woodlands. Serpentine-derived soils tend to have low levels of nitrogen, phosphorus, and calcium, combined with high levels of magnesium and potentially toxic elements such as nickel, chromium, and cobalt. Gabbro-derived soils tend to be mildly acidic and are rich in iron and magnesium and often contain other heavy metals such as chromium. These soil types support unique

assemblages of plant species with many endemic species, including a high number of special-status plant species and support a high level of plant diversity. Serpentine and gabbro soils in the project area are potential and suitable habitat for the federally listed Layne's ragwort (*Senecio layneae*).

Approximately 172 acres of serpentinite and serpentine-derived soils occur in the project area (Figures 4.5.2-1a and 4.5.2-1b). Numerous northwest to southeast trending bands of serpentine occur in the North Fork and West Branch arms of Lake Oroville. Vegetation typically consists of sparse foothill pines and scattered chaparral shrubs. These outcrops harbor many endemic species including two special-status plant species: cut-leaved ragwort (*Senecio eurycephalus* var. *lewisrosei*) and Butte County calycadenia (*Calycadenia oppositifolia*).

Approximately 64 acres of gabbro and gabbro-derived soils occur in the project area along the South Fork arm of Lake Oroville (Figure 4.5.2-1f). Plant species composition is similar to surrounding vegetation, typically a mix of moderate to dense foothill or ponderosa pine and mixed oak woodland. One special-status species, Brandegee's clarkia (*Clarkia brandegeae*), was observed on gabbro soils.

Feather River Floodplain

The Feather River extends for approximately 55 miles below the FERC Project boundary before the confluence with the Sacramento River. Approximately 32,000 acres occur within the Feather River FEMA 100-year floodplain outside the FERC Project boundary and downstream of Lake Oroville.

Although the Feather River is tightly restricted by levees in some areas, much of the river has large setback levees, forming a wide floodplain. Over half of the floodplain has been converted to agriculture.

Invasive Non-native Plant Species

Nearly all plant communities within the project vicinity have invasive and/or noxious weed species as a component. A noxious weed as defined by the California Department of Food and Agriculture (DFA) means any "species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate" (DFA Website). An invasive species is defined by the National Invasive Species Council under Executive Order 13112 as "a species that is (1) non-native (or alien) to the ecosystem under consideration, and (2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health" (Center for Invasive Plant Management Website).

Lists of noxious/invasive plant species with potential to occur in the project area were developed from DFA, the California Invasive Plant Council (Cal IPC), the U.S. Department of Agriculture (USDA), and the Plumas National Forest (PNF). During relicensing studies, all non-native species were identified and all species that were

listed at that time were mapped and recorded. Overall, 219 species of non-native plants were identified in the project area.

The weed/pest rating inventory lists developed by DFA and Cal IPC have been updated since the relicensing studies. DFA updated its list in 2004 and Cal IPC updated its list in 2006. Seventy-five species of noxious or invasive plant species that are currently listed by DFA, Cal IPC, USDA, and PNF were identified in the project area. Twenty-two of these species are identified as highly invasive wildland pests by DFA and/or Cal IPC (Table 4.5-8).

The numbers of weed species and infestations are substantially greater in lower elevation riparian and wetland areas than in upland communities, especially where some disturbance has occurred. Nineteen of the species in Table 4.5-8 were found below Oroville Dam in the OWA and in and around the Thermalito Complex. Eleven of these species were found around Lake Oroville. Species of greatest concern near the Thermalito Complex include purple loosestrife (*Lythrum salicaria*), giant reed, tree of heaven (*Ailanthus altissima*), yellow starthistle, and scarlet wisteria. Within the surrounding grasslands, yellow starthistle and medusahead are most widespread and have most likely affected native plant species to the greatest extent. Approximately 85 of the ~900 acres of wetland/riparian margin of Thermalito Afterbay contain varying densities of purple loosestrife. Please refer to the report for SP-T7, Project Effects on Noxious Terrestrial and Aquatic Plant Species, for maps and more detailed discussions. This species affects both native vegetation and wintering waterfowl nesting habitat.

Noxious weed species in the project area are most prolific in the OWA. The species of greatest concern to native riparian and wetland plant communities and wildlife habitat in this area include giant reed, tree of heaven, scarlet wisteria, parrots feather (*Myriophyllum aquaticum*), and Himalayan blackberry (*Rubus discolor*). Tree of heaven is intermingled with the valley elderberry (*Sambucus mexicanus*), habitat for the federally threatened valley elderberry longhorn beetle, in approximately 250 acres of the OWA.

Water primrose (*Ludwigia peploides*) is an aquatic plant species that occurs along the margins of ponds, waterways, and backwaters of the Feather River. Both the native (ssp. *peploides*) and non-native (ssp. *montevidensis*) subspecies occur in the area. This perennial species grows in dense mats and has been increasing in abundance since the mid-1990s. This increase has caused adverse ecological effects on several important fish species in the OWA. It has, however, increased habitat for the federally and State-listed giant garter snake.

Numerous noxious weed species occur around Lake Oroville, primarily in disturbed areas near roads, trails, and facilities, and in the immediate vicinity of the spillway and the associated power facilities. The species identified as those of greatest concern are skeleton weed (*Chondrilla juncea*); French, Spanish, and Scotch brooms (*Genista monspessulana*, *Spartium junceum*, *Cytisus scoparius*); Himalayan blackberry; and tree of heaven. Other species include edible fig (*Ficus carica*) and starthistle.

Table 4.5-8. Target weed species identified in the project area.

Genus species Common name	Cal-IPC List¹	DFA List²	Around Lake Oroville	Below Oroville Dam
<i>Aegilops triuncialis</i> Barbed goatgrass	H	B		x
<i>Ailanthus altissima</i> Tree of heaven	M	-	X	x
<i>Arundo donax</i> Giant reed	H	-	-	x
<i>Bromus madritenis</i> ssp. <i>rubens</i> Foxtail chess	H	-	X	x
<i>Centaurea solstitialis</i> Yellow starthistle	H	C	X	x
<i>Chondrilla juncea</i> Skeleton weed	M	A	x	-
<i>Cortaderia selloana</i> Pampas grass	H	-	-	x
<i>Cytisus scoparius</i> Scotch broom	H	C	-	x
<i>Ficus carica</i> Edible fig	M	-	x	x
<i>Foeniculum vulgare</i> Fennel	H	-	x	x
<i>Genista monspessulana</i> French broom	H	C	x	x
<i>Hedera helix</i> English ivy	H			x
<i>Ludwigia peploides</i> ssp. <i>Montevidensis</i> Montevideo waterweed	H			x
<i>Lythrum salicaria</i> Purple loosestrife	H	B	-	x
<i>Mentha pulegium</i> Pennyroyal	M	-	-	x
<i>Myriophyllum aquaticum</i> Parrot feather	H	-	-	x
<i>Myriophyllum spicatum</i> Eurasian milfoil	H	-	-	x
<i>Rubus discolor</i> Himalayan blackberry	H	-	x	x
<i>Sapium sebiferum</i> Chinese tallow tree	M	-	x	-
<i>Sesbania punicea</i> Scarlet wisteria	H	-	-	x
<i>Spartium junceum</i> Spanish broom	H	-	x	-
<i>Taeniatherum caput-medusae</i> Medusahead	H	C	x	x

Table 4.5-8. Target weed species identified in the project area.

Genus species Common name	Cal-IPC List¹	DFA List²	Around Lake Oroville	Below Oroville Dam
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¹ California Invasive Plant Council (2006) California Invasive Plant Inventory: H = High: invasive species with most severe wildland ecological impacts, widespread; M = Moderate: invasive species with substantial wildland impacts; local to widespread.

² California Department of Food and Agriculture List of Noxious Weeds: List A = Most invasive wildland pest plants - eradication, containment or other holding action at the State-County level; List B = Includes species less widespread and more difficult to contain—eradication, containment, control, or other holding action at the discretion of the Commissioner; List C = Weeds that are so widespread that the agency does not endorse State or County-funded eradication except in nurseries.

Source: SP-T7

Botanical Resources Baseline Project Conditions

Baseline project operations, land management practices, and project-related recreation activities have the potential to affect botanical resources in the project area including vegetation communities, riparian resources, non-native invasive plant species, and special-status plant species. Direct and indirect as well as short and long-term effects may result in changes to the dynamics and stability of existing botanical resources, including changes in species diversity and distribution. Direct and indirect effects result from the following:

- *Lake Oroville Water Level Fluctuations.* Water levels in Lake Oroville fluctuate in response to power production and flood management, and as a result of water withdrawals for irrigation or municipal water use. The large daily and seasonal fluctuations in Lake Oroville's water levels, in addition to the reservoir's steep slopes and poor soils, adversely affect the establishment of hydrophytic plant species and the development of typical littoral and riparian communities along the shoreline. Few species can withstand inundation for periods of time that are typical within the drawdown zone of the reservoir as well as the dry harsh conditions of summer and fall. Areas exposed by a spring/early summer drawdown may support some vegetation where conditions are favorable, but plant diversity is often low and may be dominated by nonnative invasive species. Habitat improvements for warmwater game fish in Lake Oroville have included planting of willows (*Salix* sp.) and buttonbush (*Cephalanthus occidentalis*) within select areas along the reservoir shoreline. These have been moderately successful and have had a moderately beneficial effect on both riparian communities along the shoreline and warmwater fish habitat.
- *Thermalito Complex Water Level Fluctuations.* Water released for daily peak power generation and pump-back operations results in minimal water level fluctuations in the Diversion Pool, Thermalito Power Canal, and Thermalito Forebay. The relatively consistent water level in the forebay maintains a narrow wetland/riparian zone. One special-status species (four-angled spikerush) occurs in the wetland margin of Thermalito Forebay. The water levels in the forebay have a beneficial effect on both wetland vegetation and special-status

species habitat. Thermalito Afterbay, however, fluctuates on a daily/weekly cycle. Over 900 acres of wetland habitat occur along the north and east edges of the afterbay. The frequent water level fluctuations within this shallow reservoir adversely affect the structural and species diversity of the wetland vegetation and create optimal conditions for the nonnative invasive species, purple loosestrife (*Lythrum salicaria*). This species has replaced and affected native wetland plant species and occupies more than 85 acres of the ~900 acres of the wetland.

Two special-status species (four-angled spikerush and Sanford's arrowhead) occur within the wetland margins of the afterbay and associated brood ponds. These species cannot tolerate the periods of drawdown in the afterbay and are restricted to low areas within the wetland margin or in the brood pond margins where a more constant water source is maintained. The relatively consistent water levels in the brood ponds and low-lying areas around the afterbay have a beneficial effect and provide and maintain habitat for these species.

- *Discharge to the Feather River.* Riparian vegetation along the Feather River has been affected by a number of causes: historic hydraulic mining, historic and current land uses, flood management levees, flow regulation, and the presence of dams, including Oroville Dam. Historically, rivers in this area experienced high flows from December through March, with snowmelt keeping the water levels high through late spring. These types of flows provide sediment for floodplain deposition and scour fresh surfaces for germination of early successional riparian species.

Under current operations, Lake Oroville is managed to capture winter and spring rains. Water is released from Lake Oroville to the Feather River as needed to meet water supply, flood management, power generation, water quality improvement, and fish and wildlife enhancement. The amount and timing of project-related flows downstream of Lake Oroville could adversely affect the extent, distribution, composition, and function of riparian vegetation along the Feather River.

Low Flow Channel—Flows in the LFC (between Thermalito Diversion Dam and the Thermalito Afterbay Outlet) are maintained year round at a minimum flow of 600 cubic feet per second (cfs), except during large flood events. Levees severely restrict the floodplain in this reach, and piles of dredger tailings have replaced the natural floodplain soils, increasing the floodplain elevation along the river. The vegetation along this reach is characterized by a high percentage of non-native invasive species and a lack of well-developed woody riparian vegetation. During low flows, riparian vegetation such as alder and non-native species grow within the active channel along the edges of the Feather River. This vegetation gets scoured when flows are high, such as during releases for flood management. This flow management results in an adverse effect on riparian plant communities because the vegetation remains in an early successional stage of development and favors noxious/invasive weed species.

High Flow Channel—Flows below the Thermalito Afterbay Outlet typically are reduced dramatically after winter high-flow events, and remain low until irrigation demands increase flows in June through September. These flows dramatically drop after downstream irrigation demands decrease and before the winter rains begin. Levees outside the FERC Project boundary along the High Flow Channel (HFC) reduce the available floodplain along portions of the river. Although large setback levees occur along much of the river, the majority of this floodplain has been converted to agriculture. In addition, levees and banks have been artificially stabilized by other entities, resulting in additional impaired riparian recruitment. The riparian forests downstream of the project area are commonly fragmented and narrow, with little to no understory compared to historic riparian forests in the area. Although project flows have less effect in these areas than the effect of agriculture and urbanization, they do affect riparian recruitment. In areas where large meander bends occur, large patches of riparian habitat exist. These existing riparian plant communities are experiencing little or no recruitment of new riparian species. Riparian vegetation away from the active channel that would normally be maturing into a later successional stage is composed of large, older cottonwoods with relatively low structural and species diversity. These forests are not replacing themselves as the older trees die out. The general lack of riparian recruitment observed during riparian/recruitment studies (DWR 2003), as well as the low structural and species diversity, is an adverse effect associated with the current flow regime that affects the long-term health of the riparian communities downstream of the project area.

- *Ground/Soil Disturbance from Operations and Maintenance Activities.* Land management agencies in the FERC Project boundary area including DWR, DFG, and DPR conduct a wide variety of maintenance activities within the area. Some of these activities affect plant habitats. These activities include maintenance of roads and parking lots, levees, and transmission line rights-of-way. Road maintenance activities have the potential to adversely affect plant communities through direct removal or by disturbance activities that tend to promote the establishment of non-native invasive species. Wetlands can be affected by operations and maintenance activities that change drainage flows or patterns or that result in direct physical disturbance. Natural areas immediately adjacent to disturbed sites tend to have a high percentage of non-native species. The replacement of native vegetation with non-native invasive species is considered an adverse effect. Utility line corridors are cleared of trees and shrubs as they encroach into the corridor. This disturbance promotes establishment of invasive species along the edges of the corridor. These plants tend to move into the adjacent natural areas and adversely affect botanical resources. Invasive weeds are currently controlled within the project area along roadways and around project facilities.
- *Disturbance from Project-Related Recreation.* Botanical resources may be directly and indirectly affected by project-related recreation. Recreation within the project area includes recreational related disturbances within the project area could result from operations and maintenance, enhancement, and/or construction

of facilities and recreation activities including boating, fishing, camping, and hiking.

Facilities Maintenance—DWR, DPR, and DFG conduct maintenance activities associated with the various recreation areas. GIS data analysis identified approximately 90 acres of trails and a number of roads associated with recreation. Maintenance activities include surface repair and vegetation management by pruning, removal, and/or herbicide treatment. These activities can result in ground disturbance that can introduce invasive species into the adjacent natural areas and adversely affect botanical resources. A number of special-status plant populations occur in and/or near recreation areas. Improvement to roads, trails, and/or camping areas may have an adverse effect on these species.

Recreational Use—Recreational use impact studies indicate that there are some moderate adverse effects on vegetation at the Thermalito Afterbay Outlet and the Stringtown Car-top Boat Ramp. Adverse effects on upland vegetation types from dispersed recreation were highest from user-defined trails where vegetation was removed and/or trampled. Most were in steep areas leading to the water's edge of Lake Oroville, which in turn has created soil erosion problems. Direct damage to vegetation also occurs at a number of dispersed recreation sites. These activities also provide disturbance areas for invasion by noxious species.

- *Wildlife Habitat and Vegetation Management.* DFG conducts a habitat enhancement program in the OWA that includes the planting of upland nesting cover and foraging vegetation for waterfowl. Approximately 200 acres of land are tilled and planted each year. These plantings consist of a variety of non-native species that can invade into adjacent grasslands and vernal pool habitats, replacing native plant species and lowering native plant diversity. This action adversely affects both native plant communities and special-status species habitats by degradation and introduction of non-native invasive plant species.

Fire suppression has resulted in adverse effects by limiting suitable habitat for some special-status plants that inhabit openings in woodland and chaparral communities. Lack of fire has resulted in unnatural monotypic, even-aged, dense stands of brush. Vegetation densities within the project area are relatively high, especially in upland habitats around Lake Oroville and the Diversion Pool. Continued fire suppression would result in the reduction of special-status plant habitat within these communities.

4.5.2.2 Listed Species

Special-Status Plant Species

This section addresses special-status plant species and their habitats that potentially occur within the Oroville Facilities project area. This includes species in the following categories:

- Species listed under FESA by USFWS as Threatened or Endangered;
- Species listed under CESA by DFG as Threatened, Endangered, or Rare;
- Plants on the PNF Sensitive and Special Interest Plant List (USFS 2003); and
- Plants on California Native Plant Society (CNPS) List 1B (plants considered by CNPS to be rare, threatened, or endangered in California and elsewhere) or List 2 (plants considered rare, threatened, or endangered in California but more common elsewhere).

A list of special-status plant species that have potential to occur in the project area was developed based on information compiled from USFWS (1999 and 2000 and updated in 2006); DFG (2002); the California Natural Diversity Database (CNDDDB); the CNPS Inventory (2001); Plumas National Forest Sensitive and Special Interest Plant List (USFS 2003); DFG's Special Plants List (DFG 2001); and the USFS Pacific Southwest Region Sensitive Plant List (USFS 1998). Table 4.5-9 summarizes the list of special-status plant species that have potential to occur in the project area. It includes 7 species that are listed under FESA and/or CESA and an additional 43 species of concern that are listed by the PNF List and/or CNPS. A few species that were included on lists from USFWS, DFG, CNDDDB, CNPS, and/or USFS are not included in Table 4.5-9. These species have very low potential for occurring in the project area due to particular soils, habitat, and/or elevational requirements.

Information on the listed species with the potential to occur in the project area were compiled from rare plant descriptions and distributions obtained from CNDDDB records, a review of CNPS (2001), *Manual of the Vascular Plants of Butte County California* (Oswald 1994), *The Jepson Manual* (Hickman 1993), other State and/or Butte County biological survey records, web-based and printed articles, and discussions with local authorities. Nomenclature conforms to Hickman (1993) and Oswald (1994).

Botanical surveys were conducted for Oroville Facilities relicensing studies during 2002, 2003, and 2004 in accordance with standard guidelines issued by DFG (2000), USFWS (1996), and CNPS (2001). Field investigations were conducted in a manner that emphasized all potential habitats for the federally listed or State-listed species (i.e., vernal pools/valley grasslands and serpentine/gabbro soils). Local reference sites were visited where possible. Areas surveyed for federally listed or State-listed species included valley grasslands around Thermalito Afterbay and Thermalito Forebay, serpentine soils in the West Branch and North Fork area of Lake Oroville, and gabbro soils along the South Fork arm of Lake Oroville. Surveys for all other special-status plant species were focused in areas where project impacts are likely to occur and within 150 feet (ft) of all project facilities. Surveys were conducted during the time of year when the target species were identifiable. Surveys were floristic in nature in that all plant species encountered during these surveys were identified to the lowest taxonomic status possible. Detailed descriptions and analysis are included in the report for SP-T2, Project Effects on Special Status Species.

Table 4.5-9. Special-status plant species with potential to occur in the project area.

Scientific Name Common Name	Status USFWS¹/DFG²/ CNPS³/PNF⁴	Habitat (elevation)	Found in Project Area
Federally Listed or State-Listed Species			
<i>Chamaesyce hooveri</i> Hoover's spurge	FT/--/1B/	Vernal pools (25–250 meters [m])	-
<i>Limnanthes floccosa</i> ssp. <i>californica</i> Butte County meadowfoam	FE/FCE/1B/	Valley and foothill grassland (mesic), vernal pools (50–90 m)	-
<i>Orcuttia pilosa</i> Hairy Orcutt grass	FE/FCE/1B/	Vernal pools (55–200 m)	-
<i>Orcuttia tenuis</i> Slender Orcutt grass	FT/CR/1B/	Vernal pools (35–1,760 m)	-
<i>Pseudobahia bahiifolia</i> Hartweg's golden sunburst	FE/CE/1B/	Cismontane woodland, valley and foothill grassland/clay (15–150 m)	-
<i>Senecio layneae</i> Layne's ragwort	FT/CR/1B/	Chaparral, cismontane woodland/ serpentinite or gabbroic (200– 1,000 m)	-
<i>Tuctoria greenei</i> Greene's tuctoria	FE/CR/1B/	Vernal pools (30–1,070 m)	-
Other Special-Status Species			
<i>Agrostis hendersonii</i> Henderson's bent grass	SC/3/--	Valley and foothill grassland (mesic), vernal pools (70–305 m)	-
<i>Allium jepsonii</i> Jepson's onion	SC/1B/--	Cismontane woodland, lower montane conifer forest/serpentinite or volcanic (300–1,160 m)	-
<i>Allium sanbornii</i> var. <i>sanbornii</i> Sanborn's onion	--/4/SI-1	Chaparral, cismontane woodland, lower montane conifer forest/usually serpentinite, gravelly (260–1,410 m)	-
<i>Arenaria "grandiflora"</i> Large-flowered sandwort	--/4/SI-1	Granite sand on road banks and openings in woods (500–1,000 m)	-
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> Big-scale balsamroot	--/1B/SI-1	Chaparral, cismontane woodland, valley and foothill grassland/sometimes serpentinite (90–1,400 m)	-
<i>Calycadenia oppositifolia</i> Butte County calycadenia	--/1B/S	Chaparral, cismontane woodland, lower montane conifer forest, meadows and seeps, valley and foothill grassland/volcanic or serpentinite (215–945 m)	Yes
<i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i> Butte County morning glory	SC/1B/--S	Lower montane conifer forest (600– 1,200 m)	-
<i>Cardamine pachystigma</i> var. <i>dissectifolia</i> Dissected-leaved toothwort	--/3/SI-1	Chaparral, lower montane conifer forest/usually serpentinite, rocky (255–2,100 m)	Yes

Table 4.5-9. Special-status plant species with potential to occur in the project area.

Scientific Name Common Name	Status USFWS¹/DFG²/ CNPS³/PNF⁴	Habitat (elevation)	Found in Project Area
<i>Carex vulpinoidea</i> Fox sedge	--/2/--	Marshes and swamps (freshwater), riparian woodland (30–1,200 m)	Yes
<i>Castilleja rubicundula</i> ssp. <i>rubicundula</i> Pink creamsacs	--/1B/--	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland/ serpentine (20–900 m)	-
<i>Clarkia biloba</i> ssp. <i>brandegeae</i> Brandegee's clarkia	--/1B/S	Chaparral, cismontane woodland/ often roadcuts (295–885 m)	Yes
<i>Clarkia gracilis</i> ssp. <i>albicaulis</i> White-stemmed clarkia	--/1B/S	Chaparral, cismontane woodland/ sometimes serpentine (245–1,085 m)	Yes
<i>Clarkia mildrediae</i> ssp. <i>lutescens</i> Golden-anthered clarkia	--/4/SI-1	Cismontane woodland, lower montane conifer forest (openings)/ often roadcuts (275–1,750 m)	-
<i>Clarkia mildrediae</i> ssp. <i>mildrediae</i> Mildred's clarkia	--/1B/SI-1	Cismontane woodland, lower montane conifer forest/ sandy, usually granitic (245–1,710 m)	-
<i>Clarkia mosquinii</i> Mosquin's clarkia	SC ⁵ /1B/S	Cismontane woodland, lower montane conifer forest/rocky, roadsides (185–1,170 m)	Yes
<i>Cypripedium fasciculatum</i> Clustered lady's slipper	SC/4/S	Lower montane conifer forest, north coast conifer forest/usually serpentine seeps and stream beds (100–2,435 m)	-
<i>Cypripedium fasciculatum</i> Clustered lady's slipper	SC/4/S	Lower montane conifer forest, north coast conifer forest/usually serpentine seeps and stream beds (100–2,435 m)	-
<i>Cypripedium fasciculatum</i> Clustered lady's slipper	SC/4/S	Lower montane conifer forest, north coast conifer forest/usually serpentine seeps and stream beds (100–2,435 m)	-
<i>Eleocharis quadrangulata</i> Four-angled spikerush	--/--/2/--	Marshes and swamps (freshwater) (30–500 m)	Yes
<i>Fritillaria pluriflora</i> Adobe-lily	SC/1B/--	Chaparral, cismontane woodland, valley and foothill grassland/often adobe (60–705 m)	-
<i>Hibiscus lasiocarpus</i> Rose-mallow	--/2/--	Marshes and swamps (freshwater) (0–120 m)	-
<i>Juncus leiospermus</i> var. <i>ahartii</i> Ahart's dwarf rush	SC/1B/--	Valley and foothill grasslands (mesic) (30–100 m)	
<i>Juncus leiospermus</i> var. <i>leiospermus</i> Red Bluff dwarf rush	--/1B/--	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools/ vernally mesic (35–1,020 m)	-

Table 4.5-9. Special-status plant species with potential to occur in the project area.

Scientific Name Common Name	Status USFWS¹/DFG²/ CNPS³/PNF⁴	Habitat (elevation)	Found in Project Area
<i>Lewisia cantelovii</i> Cantelow's lewisia	--/1B/S	Broadleaved upland forest, chaparral, cismontane woodland, lower montane conifer forest/mesic, granitic, serpentinite seeps (385–1,370 m)	-
<i>Lilium humboldtii</i> ssp. <i>humboldtii</i> Humboldt lily	--/4/SI-1	Chaparral, lower conifer forest/ openings (30–1,800 m)	Yes
<i>Lupinus dalesiae</i> Quincy lupine	--/1B/S	Chaparral, cismontane woodland, lower/ upper montane conifer forest, openings, often in disturbed areas (855–2,500 m)	-
<i>Monardella douglasii</i> ssp. <i>venosa</i> Veiny monardella	SC/1B/--	Cismontane woodland, valley and foothill grassland (heavy clay) (60–410 m)	-
<i>Myosurus minimus</i> ssp. <i>apus</i> Little mousetail	SC/3/--	Valley and foothill woodland, vernal pools (alkaline) (20–640 m)	-
<i>Paronychia ahartii</i> Ahart's paronychia	SC/1B/--	Cismontane woodland, valley and foothill grassland, vernal pools (30–510 m)	Yes
<i>Penstemon personatus</i> Closed-throated beardtongue	SC/1B/S	Chaparral, lower/upper montane conifer forest, metavolcanic (1,065–2,120 m)	-
<i>Perideridia bacigalupii</i> Bacigalupi's yampah	--/4/SI-1	Chaparral, lower montane conifer forest/serpentinite (450–1,000 m)	-
<i>Rhynchospora californica</i> California beaked-rush	SC/1B/--	Bogs and fens, lower montane conifer forest, meadows and seeps, marshes and swamps (freshwater) (45–1,010 m)	-
<i>Rhynchospora capitellata</i> Brownish beaked-rush	--/2/SI-1	Lower/upper montane conifer forest, meadows and seeps, marshes and swamps, mesic (455–2,000 m)	-
<i>Sagittaria sanfordii</i> Sanford's arrowhead	SC/1B/--	Marshes and swamps (assorted shallow freshwater) (0–610 m)	Yes
<i>Sedum albomarginatum</i> Feather River stonecrop	--/1B/S	Chaparral, lower montane conifer forest/ serpentinite (260–1,785 m)	-
<i>Senecio eurycephalus</i> var. <i>lewisrosei</i> Cut-leaved ragwort	--/1B/S	Chaparral, cismontane woodland, lower montane conifer forest/ serpentinite (550–1,470 m)	Yes
<i>Sidalcea robusta</i> Butte County checkerbloom	SC/1B/--	Chaparral, cismontane woodland (90–1,600 m)	-
<i>Silene occidentalis</i> ssp. <i>longistipitata</i> Long-stiped catchfly	SC/1B/SI-1	Chaparral, lower/upper montane conifer forest (1,000–2,000 m)	-

Table 4.5-9. Special-status plant species with potential to occur in the project area.

Scientific Name Common Name	Status USFWS¹/DFG²/ CNPS³/PNF⁴	Habitat (elevation)	Found in Project Area
<i>Trifolium jokerstii</i> Butte County golden clover	--/1B/SI-1	Valley and foothill grassland (mesic), vernal pools (50–385 m)	-
<i>Wolffia brasiliensis</i> Columbian watermeal	--/2/--	Marshes and swamps (assorted shallow freshwater) (30–100 m)	Yes
Bryophytes			
<i>Bruchia bolanderi</i> Bolander's bruchia moss	--/2/S	Lower/upper montane conifer forest, meadows and seeps, damp soil (600–1,700 m)	-
<i>Mielichhoferia elongata</i> Elongate copper moss	--/2/SI-1	Cismontane woodland (metamorphic rock, usually vernal mesic) (500– 1,300 m)	-
Lichens			
<i>Hydrothyria venosa</i> Waterfan	--/--/S	Attached to rocks in cool mountain brooks and streams; submerged	-

¹ USFWS: FT = federally Threatened; FE = federally Endangered; SC = federal species of concern (not a formal listing).

² DFG: CT = California Threatened; CE = California Endangered; CR = California rare.

³ CNPS: List 1B = plants rare, threatened, or endangered in California and elsewhere; List 2 = plants rare, threatened, or endangered in California but more common elsewhere; List 3 = plants about which more information is needed; List 4 = plants of limited distribution.

⁴ Plumas National Forest (PNF): S = Sensitive; SI-1 = Special Interest category 1 (Survey and recommend conservation measures).

⁵ USFWS recognizes two subspecies of *Clarkia mosquinii*, *ssp. mosquinii* and *ssp. xerophila*, both as SC.

Sources: USFS, DFG, CNDDDB, CNPS, USFS

Federally and/or State Listed Plant Species and Habitats

Seven federally and/or State listed plant species have potential to occur within the project area. No designated or proposed critical habitat occurs within the project area for federally listed plant species. Potential habitats for listed species were initially delineated from aerial photographs, soils maps, preliminary field surveys, and vegetation maps (SP-T4, Biodiversity, Vegetation Communities, and Wildlife Habitat Mapping).

No federally listed or State-listed plant species were found within the project area during the 2002, 2003, and 2004 surveys; however, suitable habitat does exist for all 7 listed species. Approximately 49 acres of vernal pool and vernal swale habitat exists within the grasslands of the project area. Approximately 172 acres of serpentine-derived soils and 64 acres of gabbro-derived soils exist within the project area.

Vernal Pool Habitat

Vernal pool and swale complexes are a common part of the valley grassland habitats in the project area. These pools are of the Northern Hardpan type and occur in complexes in areas of hummocky ground on terrace-alluvial derived redding soils (DFG 1998). The

Northern Hardpan pools are most threatened by urban expansion, agriculture, and long-term intensive grazing.

Approximately 49 acres of vernal pools and ephemeral swales containing vernal pool plant species were identified within the FERC Project boundary, all of which occur in the grasslands around Thermalito Afterbay and Thermalito Forebay. These pools range in size from very small (less than 3 ft in diameter) to larger pools covering nearly an acre. The majority of pools are fairly shallow; however, large, deep pools that hold water longer also occur in the area. These pools and ephemeral drainages are suitable habitat for five federally listed plant species: Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*), hairy Orcutt grass (*Orcuttia pilosa*), slender Orcutt grass (*O. tenuis*), Greene's tuctoria (*Tuctoria greenei*), and Hoover's spurge (*Chamaesyce hooveri*).

A sixth species, Hartweg's golden sunburst (*Pseudobahia bahifolia*), typically inhabits upland sites associated with undulating mima mound topography within the valley grasslands. However, this species is now known only from Fresno, Madera, Merced and Stanislaus Counties. Although the type locality is along the Feather River in Yuba County, it has been extirpated in Northern California.

Serpentine and Gabbro Soil Habitats

Serpentine and gabbro soils in the project area are potential and suitable habitat for Layne's ragwort (*Senecio layneae*). Approximately 172 acres of serpentinite and serpentine-derived soils occur in the project area in the North Fork and West Branch arms of Lake Oroville. Approximately 64 acres of gabbro and gabbro-derived soils occur in the project area along the South Fork arm of the reservoir.

Special-Status Species

Butte County Meadowfoam (*Limnanthes floccosa* ssp. *californica*). Butte County meadowfoam is both a federally listed and State-listed Endangered species. This winter annual herb appears in late March to early May in ephemeral drainages, vernal pool depressions in ephemeral drainages, and occasionally around the edges of isolated vernal pools at elevations of 165–197 ft. It generally occurs on level to gently sloping terrain on poorly drained soils with shallow soil layers impermeable to water infiltration.

This species is restricted to a narrow 25-mile strip along the eastern flank of the Sacramento Valley from central Butte County to the northern portion of the City of Chico. Although the ranges of this species has not changed significantly from historical times, the number of populations, the area occupied, and the amount of available habitat within the range has declined significantly in the last 30 years. All remaining known populations are subject to urban development, airport maintenance activities, agricultural land conversion, and highway widening or realignment. There are 4 occurrence records for Butte County meadowfoam from approximately 5 miles north of Thermalito Afterbay in the vicinity of Shippee, California.

There were no occurrences of Butte County meadowfoam located in the project area during these surveys. Approximately 49 acres of vernal pools, ephemeral drainages, and pool/swale complexes occur in the project area in the grasslands around the Thermalito Complex. Many of the ephemeral drainages could potentially support Butte County meadowfoam. White meadowfoam (*Limnanthes alba* ssp. *alba*) is a common early inhabitant of ephemeral drainages and depressions within the project area. This species is closely related to the listed Butte County meadowfoam (*L. floccosa* ssp. *californica*) and occurs in similar habitat.

Hairy Orcutt Grass (*Orcuttia pilosa*). Hairy Orcutt grass is a federally listed and State-listed Endangered species. This annual grass species occurs in drying vernal pool habitat along the eastern margin of California's Central Valley at elevations ranging from 100 to 400 ft. This late season species grows in vernal pool bottoms and along edges of pools.

Of the 39 occurrences of hairy Orcutt grass listed by CNDDDB (2006), 12 are thought to have been extirpated due to agricultural land conversion, urbanization, and intensive cattle grazing. Twenty-seven occurrences are presumed to be extant with the main area of concentration in the Vina Plains area in Tehama County. The one occurrence of hairy Orcutt grass in Butte County is found within 8 miles of the project area.

No occurrences of hairy Orcutt grass were found within the project area. Many of the larger, deeper pools were observed to be associated with clay soils that form a nearly impermeable pool bottom and are suitable habitat for this species.

Hartweg's Golden Sunburst (*Pseudobahia bahiaefolia*). Hartweg's golden sunburst is a federally listed and State-listed Endangered species. This annual herb in the sunflower family is closely associated with mima mound topography in annual grasslands and blue oak woodlands.

The type locality for this species was historically known in Yuba County along the bank of the Feather River near the confluence with the Yuba River. This type locality has been extirpated. Currently, this species is known from two general areas in eastern San Joaquin County. Remaining populations are concentrated in the Friant region of Fresno and Madera counties and the La Grange region in Stanislaus County. The extirpated occurrence from Yuba County is more than 26 miles south of the Oroville Facilities FERC Project boundary.

No occurrences or potential habitat for Hartweg's golden sunburst were found downstream of the project area along the Feather River floodplain. The vernal pools in the grasslands around Thermalito Forebay and Thermalito Afterbay contain areas of hummocky ground that could be potential habitat for this species.

Greene's Tuctoria (*Tuctoria greenei*). Greene's tuctoria is a federally listed Endangered species and a California Rare species. This species occurs from May to July along the eastern margin of the California Central Valley. Greene's tuctoria occupies small or shallow vernal pools or the margins of deeper pools.

Forty-one occurrences have been documented from Fresno to Shasta Counties. However, 19 of these populations, from Fresno, Madera, Stanislaus, Tulare, and San Joaquin counties are thought to have been extirpated. The remaining populations occur in Butte, Glenn, Merced, Shasta, and Tehama Counties. All populations are on private lands except one population at the Sacramento National Wildlife Refuge. One occurrence of Greene's tuctoria is within 150 ft of the FERC Project boundary, one within 5 miles, and another within 10 miles of the project area.

No occurrences of Green's tuctoria were found in the project area. Potentially suitable habitat exists in the larger, deeper pools that are associated with impermeable clay soil bottoms.

Hoover's Spurge (*Chamaesyce hooveri*). Hoover's spurge is a federally listed Threatened species. This prostrate annual herb grows in the bottom of drying vernal pools on the eastern margin of California's Central Valley. This species typically inhabits larger, deeper pools in areas where competition from other species has been reduced by prolonged seasonal inundation or other factors.

According to current CNDDB records (2006), 4 of the 30 occurrences of Hoover's spurge have been extirpated. The 26 extant occurrences are distributed along remnant alluvial terraces and fans, mostly along the eastern edge of the Great Central Valley in Tulare, Merced, Stanislaus, Butte, Glenn, and Tehama Counties, where it occurs below 820 ft elevation. The majority of occurrences are located near the Butte-Tehama County line in the northern Sacramento Valley. The nearest occurrence of Hoover's spurge is approximately 8 miles north of the FERC Project boundary.

Although suitable habitat exists within the project area, no occurrences were found within the study area during relicensing surveys.

Slender Orcutt Grass (*Orcuttia tenuis*). Slender Orcutt grass is a federally listed Threatened species and a State-listed Endangered species. This annual grass species is found most often in the drying bottoms of large, deep vernal pools on remnant alluvial fans, high stream terraces, and recent basalt flows in valley grassland and blue oak woodland.

It is restricted to Northern California and occurs in disjunct populations from Siskiyou County to Sacramento County. The primary area of concentration is in the vicinity of Dales, Tehama County, with a second concentration on the Modoc Plateau Vernal Pool Region in Lassen, Plumas, Shasta, and Siskiyou counties. Two occurrences of slender Orcutt grass occur in Butte County within 1 mile of the project area.

Large, deep vernal pools with clay soils that form a nearly impermeable pool bottom occur in the project area. These deep pools are suitable habitat for this species. Slender Orcutt grass was not found in the project area during these surveys.

Layne's Ragwort (*Senecio layneae*). Layne's ragwort is a federally listed Threatened species and a State-listed Rare species. This perennial herb is found in open rocky

areas of serpentine and gabbroic derived soils within chaparral and chaparral/open pine or oak woodlands at elevations of 660–3,300 ft.

There are 43 extant occurrences of Layne's ragwort identified in the CNDDDB from El Dorado, Tuolumne, and Yuba counties. Most known sites are scattered within a 40,000-acre area in western El Dorado County that includes the Pine Hill intrusion and adjacent serpentine. Two of the 43 records are in Yuba County, approximately 5 miles southeast of the South Fork arm of Lake Oroville on BLM land.

Approximately 172 acres of serpentine and serpentine-derived soils and 64 acres of gabbro and gabbro-derived soils occur in the project area around Lake Oroville. These serpentine- and gabbro-derived soils with sparse vegetation cover are potential habitat for Layne's ragwort. Layne's ragwort was not found in the project area during relicensing studies.

Other Special-Status Plant Species

Species identified here include rare plants that are not federally listed or State-listed species but are listed by USFS and/or BLM as Sensitive or Special Interest Species and taxa on CNPS Lists 1, 2, and 3.

A list of 51 special-status plant species with the potential to occur in the project area was developed based on information compiled from USFWS (1999 and 2002); DFG (2002), CNDDDB records; the CNPS Inventory (2001); PNF Sensitive and Special Interest Plant list (USFS 2003); DFG's Special Plants List (DFG 2001); and the USFS Pacific Southwest Region Sensitive Plant list (USFS 1998). Botanical surveys were conducted in accordance with standard guidelines issued by DFG (2000), USFWS (1996), and CNPS (2001). Relicensing studies indicate the presence of suitable habitat within the project area for 40 vascular plant species, 2 bryophytes (mosses), and 1 lichen species (Table 4.5-9). Detailed descriptions and analysis are included in the SP-T2 report.

Fourteen special-status plant species were found within the project area during relicensing studies, as listed in Table 4.5-9. Five of these species were found within the OWA and Thermalito Complex. Four-angled spikerush and Sanford's arrowhead were found around the margins of Thermalito Afterbay. Four-angled spikerush was also found bordering Thermalito Forebay, small ponds in the OWA, and the larger One-Mile Pond in the OWA. Fox sedge was found bordering the Diversion Pool. Columbian watermeal was found in a number of ponds in the OWA. Ahart's paronychia was located along the margins of vernal pools south of Thermalito Forebay.

Nine special-status species were found in upland habitats around the Diversion Pool and/or lands around Lake Oroville. These include Butte County calycadenia, dissected-leaved toothwort, Brandegees clarkia, white-stemmed clarkia, Mosquin's clarkia, Butte County fritillary, cut-leaved ragwort, Humboldt lily, and shield-bracted monkeyflower.

Butte County calycadenia (*Calycadenia oppositifolia*) is a slender annual herb in the sunflower family. This species is restricted to a 32-mile band along the Sierra Nevada and Cascade Range foothills and lower coniferous forest from northeast of Chico to southeast of Oroville at elevations of 295–3,100 ft. Butte County calycadenia grows on shallow soils in openings in blue oak woodlands, chaparral, mixed oak woodlands, and pine/mixed oak woodlands.

Brandeggee's clarkia (*Clarkia biloba* ssp. *brandegeae*) is an annual herb in the evening primrose family. It occurs in the Sierra Nevada foothills from Butte, Yuba, Nevada, Placer, and El Dorado Counties at elevations of 970–2,900 ft. Brandeggee's clarkia grows in openings and roadcuts in blue oak woodlands, chaparral, mixed oak woodlands, and pine/mixed oak woodlands.

White-stemmed clarkia (*Clarkia gracilis* ssp. *albicaulis*) is an annual herb in the evening primrose family. It is known only from Butte and Tehama Counties at elevations of 800–3,500 ft. White-stemmed clarkia grows in openings and roadcuts in chaparral, mixed oak woodlands, and pine/mixed oak woodlands.

Mosquin's clarkia (*Clarkia mosquinii*) is an annual herb in the evening primrose family. It is known only from Butte and Plumas Counties at elevations of 600–4,320 ft. Mosquin's clarkia grows in openings and roadcuts in chaparral, mixed oak woodlands, pine/mixed oak woodlands, and lower mixed conifer forest, mostly on southerly-facing slopes.

Ahart's paronychia (*Paronychia ahartii*) is an annual herb in the pink family. It is known from Butte, Shasta, and Tehama Counties at elevations of 180–1,750 ft. Ahart's paronychia is found in valley and foothill grasslands and vernal pools, and in grasslands within foothill woodlands.

Sanford's arrowhead (*Sagittaria sanfordii*) is a perennial herb in the water-plantain family. It is known from Del Norte, Shasta, Tehama, Butte, Sacramento, San Joaquin, Fresno, Merced, Kern, Ventura, and Orange Counties, although it is reported as extirpated from Ventura and Orange Counties. The elevation range of this species is 0–2,000 ft. Sanford's arrowhead is found in marshes and swamps, including the edges of shallow ponds.

Cut-leaved ragwort (*Senecio eurycephalus* var. *lewisrosei*) is a perennial herb in the sunflower family. It is known only from Butte and Plumas Counties at elevations of 940–4,960 ft. Cut-leaved ragwort is found on serpentine soils and outcrops, in chaparral, foothill woodlands, and lower coniferous forests.

Fox sedge (*Carex vulpinoidea*) is a perennial herb in the sedge family. In California, it is reported from a few widely scattered occurrences in Siskiyou, Trinity, Shasta, Tehama, and Butte Counties at elevations of 22–2,400 ft. Fox sedge grows on moist soils along streams, ditches, ponds, and reservoirs.

Four-angled spikerush (*Eleocharis quadrangulata*) is a perennial herb in the sedge family. It is known from Shasta, Tehama, Butte, and Merced counties at elevations of

77–612 ft. Four-angled spikerush grows in the shallow edges of freshwater marshes, swamps, and ponds.

Columbian watermeal (*Wolffia brasiliensis*) is a perennial aquatic herb in the duckweed family. In California, it is known from only 5 widely scattered occurrences in Butte, Glenn, and Yuba counties at elevations of 60–350 ft. Columbian watermeal grows floating on the surface of shallow freshwater sloughs and ponds.

Dissected-leaved toothwort (*Cardamine pachystigma* var. *dissectifolia*) is a perennial herb in the mustard family. It occurs in the coastal mountains of Mendocino, Sonoma, and Glenn counties and mid-elevations of the Sierra Nevada from Tehama to Placer counties. It occurs at elevations of 660–6,900 ft. In Butte County it grows in partial shade of Ponderosa pine and mixed conifer forest and associated chaparral.

Butte County fritillary (*Fritillaria eastwoodiae*) is a perennial herb in the lily family. It is known from Shasta, Tehama, Butte, Yuba, Nevada, and Placer counties at elevations of 164–4,920 ft. Butte County fritillary grows in partial shade in chaparral and foothill woodlands and in openings in the lower coniferous forest.

Baseline Project Conditions

The following baseline Oroville Facilities operations potentially could cause direct and indirect effects on special-status plant species and habitats within the project area:

- Fluctuations in Lake Oroville's water levels;
- Fluctuations in Thermalito Afterbay's water levels;
- Ground/soil disturbance and habitat degradation from operations and maintenance activities; and
- Disturbance from project-related recreation.

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4.6 LAND USE

This section provides an overview of land ownership, management, and land use patterns in the study area (which is defined as lands within 0.25 mile of the FERC Project boundary). The discussion includes spatial information related to ownership and land use patterns relative to five distinct study sub-areas: (1) Lake Oroville, (2) the Diversion Pool and Thermalito Forebay, (3) Thermalito Afterbay, (4) the Low Flow Channel (LFC) and the Oroville Wildlife Area (OWA), and (5) Feather River Service Area (FRSA).

4.6.1 Land Ownership, Management, and Use Patterns

Land ownership within the study area is characterized by substantial public land holdings. Figures 4.6-1a, 4.6-1b, and 4.6-1c depict land ownership in the study area and within the FERC Project boundary. Land ownership in the FRSA is made up of mostly private land holders for agricultural production land uses; see Appendix G-LU1 (Figure G-LU1-2) in the PDEA (DWR 2005) for a definition of the FRSA geographic area and agricultural land use types. Overall, approximately 69 percent (approximately 48,600 acres) of land within the approximately 70,500-acre study area is publicly owned. Of the publicly owned land in the study area, approximately 23 percent (approximately 11,000 acres out of 48,600) is owned by the federal government, 77 percent (approximately 37,200 acres) is owned by the State, and nearly 1 percent (approximately 400 acres) is owned by local jurisdictions (Butte County, the City of Oroville, and the Feather River Recreation and Park District [FRRPD]). Private entities own approximately 29 percent (approximately 20,700 acres) of land in the study area. The remaining approximately 2 percent of the study area (approximately 1,200 acres) is considered to be the “Other” ownership type, which primarily represents road rights-of-way that are often held in fee by the State (i.e., the California Department of Transportation) or Butte County.

All of the land within the FERC Project boundary is publicly owned. Approximately 15 percent (6,240 acres) of the land in the FERC Project boundary is owned by the federal government, and 85 percent (34,900 acres) is owned by the State (i.e., DWR, DFG).

DWR, on behalf of the State of California, “owns” or has fee-title to (i.e., is the controlling agency for) about 29,240 acres and DFG “owns” or has fee-title to approximately 5,660 acres of State-held lands within the FERC Project boundary. Figure 5.3-1, DWR Land Management Map, of the report for Study Plan L2 (SP-L2), Land Management, illustrates the locations of these lands and the facilities with which they are associated in the study area.

Table 4.6-1 summarizes the land ownership distribution of the study area and FERC Project boundary. More detailed ownership data are available in the report for SP-L1, Land Use Study.

Table 4.6-1. Land ownership inside the FERC Project boundary and in the study area.

Landowner	Inside the FERC Project Boundary ¹		Study Area ²	
	Acres	Percent	Acres	Percent
Public				
Federal	6,240	15%	11,300	16%
State	34,900	85%	36,890	52%
Local Agencies	0	0%	440	1%
Subtotal: Public	41,140	100%	48,630	69%
Private	0	0%	20,700	29%
Other³	0	0%	1,200	2%
TOTAL	41,140	100.0	70,530	100.0

¹ Includes lands within the FERC Project boundary.

² Includes lands within 0.25 mile of the FERC Project boundary.

³ Represents road rights-of-way and public trust areas (e.g., river channel) without an official parcel number.

Source: SP-L1, Table 5.2-1

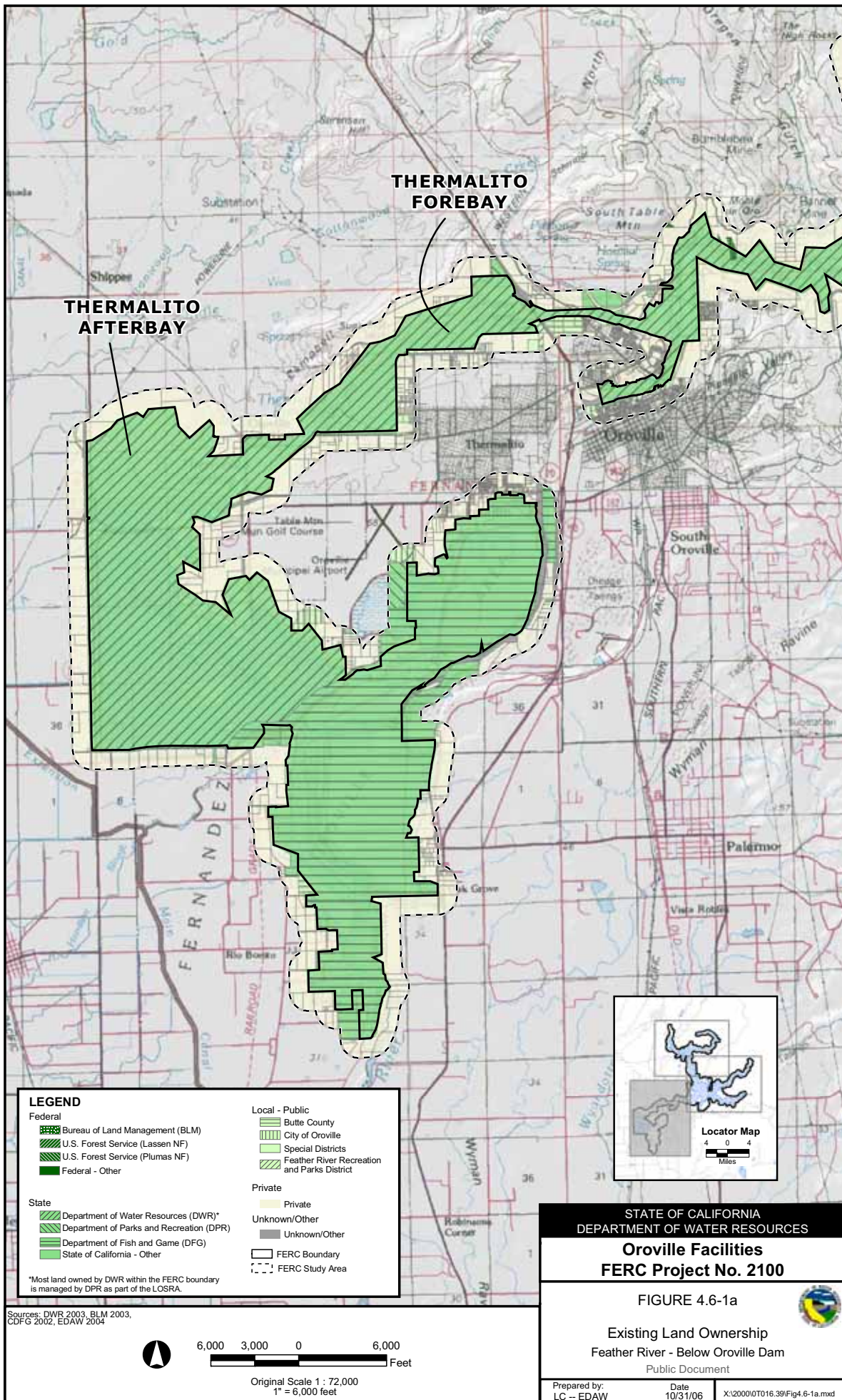
Land management in the study area is diverse, as illustrated by the multiple public land owners/managers described later in this section. In addition, there are substantial private property interests that are located inside the study area, but outside the FERC Project boundary. As illustrated in Figure 5.5-1, Land Management Direction from the report for SP-L2, Land Management Study, land management direction for most lands within the FERC Project boundary emphasizes recreation, wildlife conservation, and public facilities. Lands adjacent to the FERC Project boundary within the study area have different management directions, such as agricultural/rural residential development, timber preserve, conservation, recreation, and scenic lands.

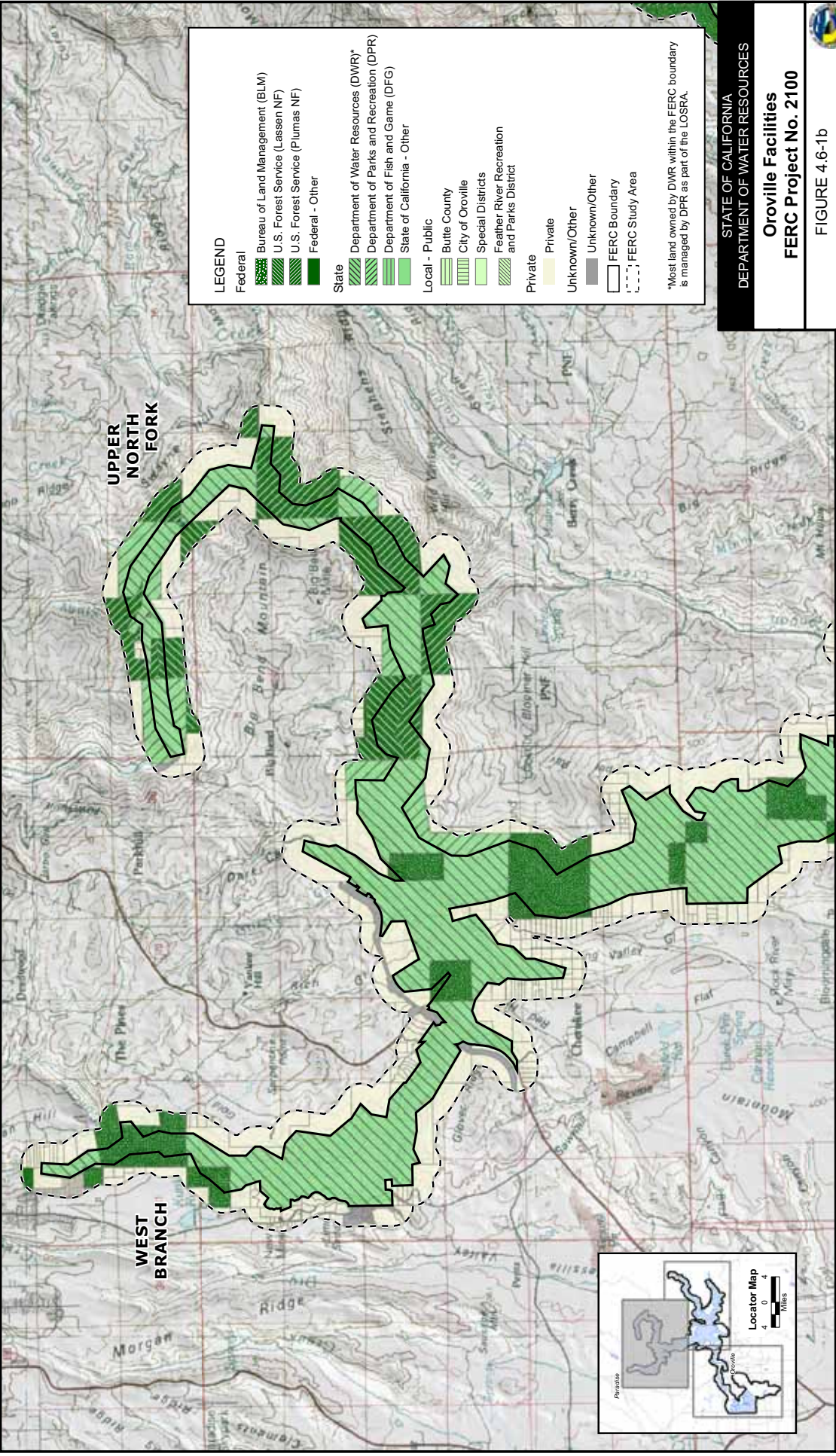
Land use patterns within the study area are diverse. To categorize the variety of land uses, a land use classification system was developed for this document that utilizes eight major land use classifications: Reservoir/Open Water, Recreation, Conservation, Resource Extraction, Undeveloped, Urban, Rural, and Other. The report for SP-L1 describes the location patterns and how the eight classifications were developed.

The following discussion provides an overview of the land ownership, management, and use patterns for the four geographic sub-areas of the Oroville Facilities (i.e., Lake Oroville, the Diversion Pool and Thermalito Forebay, Thermalito Afterbay, and the LFC and OWA).

4.6.1.1 Lake Oroville

Ownership patterns in the Lake Oroville sub-area vary by location. Most of the land in the study area outside of the FERC Project boundary is privately owned, and most of the land within the FERC Project boundary is State-owned. Lands underlying and adjacent to the main body of Lake Oroville are primarily owned by DWR, but managed by DPR as part of the Lake Oroville State Recreation Area (LOSRA). There are scattered areas of federally owned lands both within the study area and within the FERC Project boundary (including underneath Lake Oroville). Federal lands are





STATE OF CALIFORNIA

DEPARTMENT OF WATER RESOURCES

Oroville Facilities

FERC Project No. 2100

FIGURE 4.6-1b

Existing Land Ownership

Lake Oroville - North

Public Document

Prepared by:

LC - EDW

Date:

10/31/06

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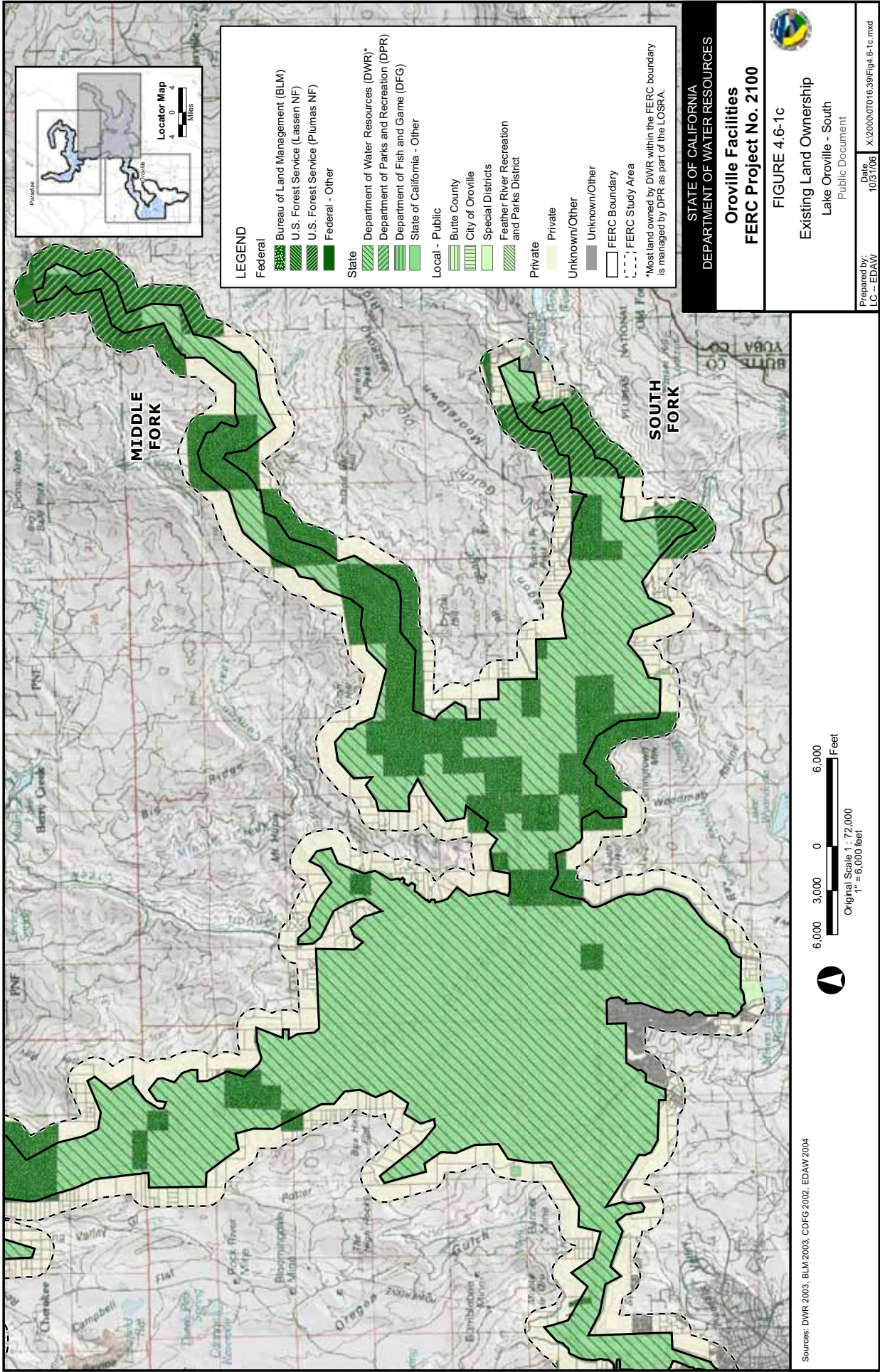
6,000

Feet

Original Scale 1" = 72,000

1" = 6,000 feet

Sources: DWR 2003, BLM 2003, CDFG 2002, EDW 2004



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generally located in the upper ends of the branches of Lake Oroville. The West Branch Feather River area is characterized by a relatively large amount of BLM land. The ownership pattern in the North Fork Feather River area is the most diverse in the study area, characterized by blocks of noncontiguous properties owned/managed by DWR, USFS (both Plumas and Lassen National Forest), DPR, and private interests. The Middle Fork and South Fork Feather River areas have similar ownership characteristics, containing a mix of DWR, BLM, USFS, and private land owners/managers. A small portion of the only Bureau of Indian Affairs-administered property (Enterprise Rancheria) is located along the Middle Fork Feather River tributary outside of the FERC Project boundary. Lands along the east, west, and south banks of the main body of Lake Oroville outside of the FERC Project boundary but within the study area are owned predominantly by private interests with limited public land holdings.

Lands underlying and adjacent to the main body of Lake Oroville, as well as surface waters of the LOSRA, are managed almost exclusively for recreational use. Small areas outside of the FERC Project boundary but within the study area in the Upper North, Middle, and South Forks are classified by USFS as unproductive forest lands (due to steep terrain and difficult access) that receive minimal management. Lands managed by BLM in these areas have been identified in the BLM's *Redding Resource Management Plan* (RRMP) for transfer to other entities.

The Middle Fork and South Fork Feather River areas have similar management characteristics, containing a mixture of lands managed by DPR, BLM, USFS, and private interests. Most of the lands along these two branches are currently managed for recreation and resource conservation, with limited areas for timber preserve. Butte County also has jurisdiction along these branches for private lands, although some are not provided with a zoning classification and continue to receive little to no management direction.

Lake Oroville covers approximately 15,400 surface acres when the reservoir level is at 900 feet above mean sea level (DWR 2001). Although Lake Oroville is classified as Reservoir/Open Water under the land use classifications used in this report, the reservoir's primary purpose is water supply serving the SWP; secondary uses include power generation, flood management, recreation, and fishery/wildlife habitat enhancement. For the most part, land immediately adjacent to the reservoir is contained within the LOSRA and is managed by DPR for recreational purposes and it has additional value as wildlife habitat. These lands include various developed facilities such as marinas, campgrounds, and boat launches, as well as undeveloped areas that are open to the public for dispersed recreational use. The only notable urban use in this sub-area is the Kelly Ridge residential development, located adjacent to the FERC Project boundary. Kelly Ridge is located on the south side of the reservoir, just east of Oroville Dam. On USFS lands in the upper portions of the North and South Fork Feather River branches are several areas classified as Resource Extraction. These areas would potentially allow timber harvest. The remainder of the Lake Oroville sub-area has been classified as Undeveloped and Conservation, with isolated rural areas.

4.6.1.2 *Diversion Pool and Thermalito Forebay*

The Diversion Pool and Thermalito Forebay study area contains landowners such as the federal government, the State, Butte County, the City of Oroville, FRRPD, and private interests. Public ownership in this segment tends to be at the State and local level, with several small BLM properties located west of Oroville Dam the only federal properties in the sub-area. All lands within the FERC Project boundary in this portion of the project are owned by the State. DWR is the primary landowner in this sub-area, administering land underlying the Diversion Pool and Thermalito Forebay, which is managed by DPR as part of the LOSRA. This sub-area also contains the majority of the City- and County-owned property in the study area. City properties are located along Montgomery Street within the city limits of Oroville; these properties are outside the FERC Project boundary. A cluster of County-owned properties is located just east of Thermalito Forebay, south of the FERC Project boundary. In this sub-area, private interests own the majority of the land outside the FERC Project boundary but within the study area.

The Diversion Pool and Thermalito Forebay area is particularly diverse in terms of land use. These lands contain a variety of management directions, including public facility management, commercial, recreation, agriculture, residential, and conservation. This sub-area is bisected by State Route (SR) 70, which separates the Diversion Pool area to the east and the Power Canal and Thermalito Forebay area to the west. Other transportation infrastructure includes the Union Pacific Railroad and numerous city/county roadways. The three water features, the Diversion Pool, Power Canal, and Thermalito Forebay, represent a significant land use and are classified as Reservoir/Open Water.

For the most part, the Recreation classification surrounds these water features, and includes the North and South Forebay recreation sites. Areas classified as Residential are located primarily west of the dam in the City of Oroville. Similarly, a range of Commercial/Industrial lands are found in the Oroville area along the LFC of the Feather River. The majority of the Oroville Facilities are located within the FERC Project boundary in this sub-area, including Oroville Dam, the Hyatt Pumping-Generating Plant, Palermo Canal Outlet Tunnel, Thermalito Diversion Dam, the Fish Barrier Dam, the Feather River Fish Hatchery, and the Thermalito Forebay Dam and Thermalito Pumping-Generating Plant. In terms of rural land uses, several pockets of land classified as Agriculture are found interspersed along with areas classified as Undeveloped.

4.6.1.3 *Thermalito Afterbay*

Ownership in the Thermalito Afterbay sub-area includes the State, Butte County, and the City of Oroville. Lands within the study area and outside of the FERC Project boundary are primarily owned by private interests, with the exception of small clusters of City- and State-owned properties within and around the OWA. All lands within the FERC Project boundary in this portion of the project are owned by the State.

Management in the Thermalito Afterbay area is somewhat complex. DFG is the primary land manager in this sub-area, which includes lands underlying Thermalito Afterbay as part of the OWA. However, DWR is responsible for recreation management at Thermalito Afterbay. DFG management direction for this area is primarily wildlife conservation and recreation. DWR has several third party leases and supports the active management of lands through these leases, which can improve land management accountability within the study area.

The Thermalito Afterbay sub-area is the most uniform in terms of land use. This area is characterized primarily by the Reservoir/Open Water and Conservation classifications within the FERC Project boundary, and Undeveloped and Agriculture classifications outside the FERC Project boundary (but within the study area). The Reservoir/Open Water classification reflects Thermalito Afterbay, and the Conservation classification represents the fact that this area is managed by DFG as part of the OWA. Outside the FERC Project boundary, Agriculture-based lands are concentrated west of SR 99 and south of Hamilton Road. Land use features located in this sub-area include several brood ponds, a shooting range, model airplane club, the Western Canal & Richvale Canal Outlet, Sutter Butte Canal Outlet and the Thermalito Afterbay Outlet, as well as several recreation sites, including the Monument Hill, Wilbur Road, and Larkin Road recreational facilities.

4.6.1.4 Low Flow Channel and OWA

Land within the study area that is outside of the FERC Project boundary is owned by an array of entities. Most of the land is owned by private interests, with other parcels owned by the State, Butte County, and the City of Oroville. Lands within the FERC Project boundary are owned by the State.

The OWA is the primary feature of the LFC and OWA sub-area. Those portions of the OWA within the FERC Project boundary are owned by the State and managed by DFG. Lands in this sub-area located outside the FERC Project boundary are managed by a mix of public and private interests, including DFG, Butte County, and the City of Oroville. Part of the LFC is within the FERC Project boundary and part is outside. DFG management direction for the OWA, which applies primarily to lands within the FERC Project boundary, is wildlife conservation and recreation. Management direction for some locations within this sub-area may be inconsistent at times.

The eastern part of the OWA is the major feature of the LFC and OWA sub-area and is located predominantly within the FERC Project boundary. Because of DFG management of the OWA, most land within the LFC and OWA sub-area has been classified Conservation. However, it is acknowledged that recreational use of the OWA (which includes the Rabe Road Shooting Area located outside of the FERC Project boundary) is considerable, with an emphasis on hunting and fishing activities. Other recreational uses in this area, but outside of the FERC Project boundary, include the Clay Pit State Vehicular Recreation Area (SVRA). In addition, there are currently gravel mining and rock removal leases to the west of SR 70 (within the OWA) that are held by private interests under lease agreements with the State. According to State lease

records, the area associated with gravel mining and rock removal operations within the OWA totals approximately 160 acres (DWR 2003). These lands are classified as Resource Extraction. Lands in this sub-area that are located outside the FERC Project boundary are diverse in terms of land use: Residential areas located north of the OWA along SR 162 and to the east of the OWA near Palermo Road, Commercial/Industrial areas located along Feather River Boulevard, Agriculture areas that surround the lower half of the OWA outside the FERC Project boundary, and Undeveloped areas interspersed within and around the OWA.

4.6.2 Land Management Entities

This section identifies the land management entities responsible for managing lands within the study area and FERC Project boundary, reviews the locations of lands managed by the various entities, and discusses the management direction of the entities. Figure 5.1-2, Primary Land Management Responsibility, of the report for SP-L2 depicts the entities responsible for managing lands in the study area.

4.6.2.1 Federal

Federal lands account for approximately 16 percent (11,300 acres) of the study area and 15 percent (6,240 acres) of land within the FERC Project boundary. Two federal agencies (USFS and BLM) manage the federal lands within the FERC Project boundary (Table 4.6-2).

U.S. Forest Service

USFS manages approximately 6 percent (4,370 acres) of lands in the study area and 4 percent (1,620 acres) of lands within the FERC Project boundary. Approximately 95 percent of the USFS lands are contained within the Plumas National Forest. The remaining 5 percent of USFS lands are located in the Upper North Fork and are part of the Lassen National Forest but are managed by the Plumas National Forest.

Management of USFS lands in the study area and FERC Project boundary is guided by several management plans and documents including the *Plumas National Forest Land and Resource Management Plan* (LRMP), *Herger Feinstein Quincy Library Group Forest Recover Act Environmental Impact Statement*, and the *Sierra Nevada Framework Record of Decision* (ROD). The Plumas National Forest LRMP management goals and policies direct the management of the Forest over 10–15 years (the “planning period”) and help meet long-term objectives over a 50-year period (the “planning horizon”). The LRMP is the document that guides most of the day-to-day management of the Forest. LRMP directives for the lands in the study area and FERC Project boundary primarily emphasize resource conservation, provision of high quality recreational opportunities, and protection of visual resources.

All USFS lands are managed through specific land use designation called Management Prescriptions. Each Management Prescription is composed of appropriate standards and guidelines that will meet some particular need (such as special habitat protection, recreation, recreation quality enhancement, or timber production) while allowing other

compatible activities. This direction supplements the *Forest-wide Standards and Guidelines*, which must always be applied (USFS 1998).

Table 4.6-2. Summary of public entity land management.

Public Entities	ACRES OF MANAGEMENT			
	Inside FERC Project Boundary	Percent Inside FERC Project Boundary	Study Area	Percent of Total Study Area
Federal				
USFS ¹	1,620	4%	4,400	6%
BLM	4,620	11%	6,600	9%
Other	0	0%	0	0%
Subtotal Federal	6,240	15%	11,000	15%
State				
DWR	2,000	5%	2,200	3%
DPR	22,100	54%	23,000	32%
DFG	11,200	27%	12,000	17%
Other	0	0%	0	0%
Subtotal State	34,900	85%	37,200	52%
Local Jurisdictions	Private/Local Lands Subject to Local Land Management			
Butte County	0	0%	21,300	31%
City of Oroville	0	0%	1,100	2%
Subtotal Local	0	0%	22,400	33%
TOTAL	41,140	100%	70,500	100%

¹ Includes all management authority except for recreation and law enforcement, which was transferred to DPR.

Sources: Butte County 2003 staff review of acreage totals from USFS, BLM, DWR, DPR, DFG, and City of Oroville; SP-L2, Table 5.1-1

Some USFS lands in the study area and FERC Project boundary (along the Upper North Fork and South Fork) have Management Prescriptions that would allow for varying degrees of timber harvest, and some are located in areas that might support timber harvest if not for steep terrain and difficult access. Many of these lands have been classified as unproductive or unsuitable for timber harvest. Due to resource protection concerns and difficult access, many of the USFS lands in the study area and FERC Project boundary have been managed in the past as de facto resource conservation lands. Under current USFS direction, these lands are being considered for fuel load management if they could be a threat to nearby urbanized areas.

USFS does not actively manage facilities or activities on most lands within the study area and FERC Project boundary. USFS and DPR have an agreement concerning management of USFS lands within the FERC Project boundary that are part of the LOSRA. The agreement, dated March 16, 1978, allows DPR to conduct law enforcement activities on USFS lands (USFS does, however, provide law enforcement to address illegal activities that take place on USFS lands such as illegal dumping of trash and hazardous materials, drug production lab debris, and vandalism of cultural resource sites). USFS retains all other authorities. In the agreement, USFS

"transferred interest" in USFS lands "within project boundaries shown in Exhibit K of the FERC license No. 2100 to permit the DPR to use, and protect said lands in a manner necessary to administer them for recreation purposes and, to the extent permissible, to enforce all applicable laws and regulations thereon." USFS is not interested in changing or terminating the agreement at this time but will reevaluate the agreement during the next Forest Plan revision (pers. comm., Taylor 2004). Currently, any development planned in conjunction with the Oroville Facilities on USFS lands, including construction of any facilities or infrastructure, within the National Forest must be approved by USFS prior to implementation (pers. comm., Humphreys 2003).

U.S. Bureau of Land Management

Federal lands managed by BLM are scattered throughout the region, primarily in the northern reaches of the West Branch Feather River, within the main body of the reservoir, and in the Middle and South Fork tributaries. In total, BLM manages approximately 9 percent (6,640 acres) of the land in the study area and 11 percent (4,620 acres) of lands within the FERC Project boundary. Most of these lands are noncontiguous, scattered parcels, some of which are submerged under Lake Oroville (see Figure 5.2-2 in the report for SP-L2).

BLM manages lands in the study area under the direction of the 1993 RRMP. Lands managed by BLM in and around the study area are designated as "undeveloped public lands." BLM has expressed a desire to surplus many properties in the study area and FERC Project boundary with public agencies. At an operational level, BLM has prioritized the following three management objectives for lands in and near the study area (pers. comm., Berg 2003):

1. Identify what lands are of specific interest to the State of California within the study area;
2. Design the mechanism(s) to effect transfer of surplus federal lands to the State of California; and
3. Complete transfer.

DWR and DPR have engaged in discussions with BLM regarding potential transfer of BLM lands to the State of California. In addition, DPR has submitted applications to BLM for land transfer sites within the study area in the vicinity of Stringtown Mountain along the South Fork of the Feather River. This area is of great cultural interest to the four recognized tribes in the Oroville area. Cultural issues are currently the major local management issues facing BLM (pers. comm., Matzat 2003).

Federal–Other

Due to the nature of the Geographic Information System (GIS) mapping process, certain lands in the study area are classified as Federal–Other (none of these lands are within the FERC Project boundary). These lands represent areas that are coded as federal lands in the Butte County parcel base. The parcel base does not track agency-level

ownership information, and these lands are not covered by the agency-specific data sources. These areas are a product of agency-specific data not completely matching the boundaries in the parcel data, thus resulting in small “sliver” polygons that cannot be attributed to a particular agency. These lands represent a minor percentage (less than 1 percent) of the study area total.

4.6.2.2 State of California

The State of California (DWR) owns and manages approximately 53 percent (37,200 acres) of land in the study area and 85 percent (34,900 acres) of land within the FERC Project boundary. DWR and DFG have fee title to all of the State-owned land within the FERC Project boundary and have a mandate to manage public recreation and fish and wildlife preservation and enhancement in connection with the SWP. At the Oroville Facilities, the management of various resources is shared among three agencies—DWR, DPR, and DFG. In 1961, DWR transferred recreational interests and management responsibility for 23,000 acres within the FERC Project boundary to DPR. These lands constitute the majority of the LOSRA. DPR is charged with designing, constructing, operating, and maintaining public recreational facilities on these lands. In 1961, DWR transferred approximately 12,000 acres of land within the FERC Project boundary to DFG. These lands constitute much of the OWA reserving any interests necessary to construct, operate, and maintain the SWP. DFG is charged with State-wide management of fish and wildlife habitats/associated recreational facilities.

The following sections discuss the State agencies with land and resource management responsibilities within the study area and FERC Project boundary.

California Department of Water Resources

As the owner, manager, and operator of the Oroville Facilities, which include all dams, powerhouses, and transmission facilities located within the FERC Project boundary, DWR has direct management responsibility for approximately 2,000 acres within the FERC Project boundary that are not managed by DPR as part of the LOSRA or DFG as part of the OWA. The lands that DWR has primary management responsibility for are generally related to operation of the project. DWR also has primary management responsibility for approximately 2,000 acres in the study area. Management of the Oroville Facilities is based on the terms of the existing FERC license. Day-to-day operations of the facilities are the responsibility of DWR. DWR has leased several parcels totaling approximately 700 acres to private groups or individuals in locations where DWR has primary management authority, as well as in locations within the OWA and LOSRA. These leases are generally located on scattered, noncontiguous parcels west of Oroville Dam and within the OWA and are summarized in Table 4.6-3. In addition, Table 5.3-1 of the report for SP-L2 provides more detailed information regarding known third-party lease arrangements with DWR.

Table 4.6-3. DWR third-party leases.

Purpose	Type	Acres	Lessee
Cattle grazing	Private	417	John Campbell
Community recreation	Local public	44	FRRPD
Cemetery	Private	23.7	Cemetery ¹
Site for flying model airplanes	Private	Not Known	Model Aircraft Flying Facility
Shooting range	Local public	9	Butte College
Rock removal	Local public	10	Joint Water Districts Board
Gravel extraction	Private	50	Mathews Ready Mix
Gravel extraction	Private	100	Granite Construction
Game bird raising	Private	77	K & L Quail Ranch ¹

¹ Outside FERC Project boundary but within the 0.25-mile study area.

Source: Maria Chin, DWR Division of Land and Rights-of-Way November 2003 (see SP-L2, Section 5.3-1)

California Department of Parks and Recreation

As mentioned previously, upon completion of the Oroville Facilities, the recreational interest for lands within what is now the LOSRA was transferred by DWR to DPR. The transfer was completed under the *Agreement for Transfer to Department of Parks and Recreation of Interest in Certain Real Property at Oroville Division of State Water Project*. DPR has the primary recreational management responsibility for most of the land underlying and surrounding Lake Oroville and its facilities, including lands that comprise the LOSRA. DPR coordinates management of the LOSRA with DWR, the California Department of Boating and Waterways (DBW), DFG, CDF, Butte County, the California Highway Patrol (CHP), USFS, volunteer organizations, and other groups and agencies. Although DPR manages the majority of LOSRA's recreational aspects, DWR bears the ultimate responsibility under the current FERC license for ensuring funding, development, and management of current and additional recreational facilities and FERC Project 2100. The Davis-Dolwig Act (Water Code Sections 11910–11925) requires DWR to plan for and acquire land for recreation in conjunction with all SWP facilities. In keeping with its responsibility, DWR works with DPR and DFG to provide for recreational opportunities and funding throughout the FERC Project boundary and LOSRA.

The LOSRA consists of major facilities at Loafer Creek, Bidwell Canyon, Spillway, Lime Saddle, the Lake Oroville Visitors Center, and North and South Thermalito Forebay and includes waters and lands in the West Branch, Upper North Fork, Lower North Fork, Middle Fork, South Fork, and the main basin. Figure 5.3-2 of the report for SP-L2, Land Management Study, depicts the locations of these facilities.

DPR has management responsibility for approximately 32 percent (23,000 acres) of land within the study area. Within the FERC Project boundary, DPR has management responsibility for approximately 54 percent (22,100 acres) of the land within the FERC Project boundary, all of which is located in the LOSRA. DPR's management responsibilities for the LOSRA include addressing a variety of issues such as safety, facilities maintenance, and overall visitor management for all recreational activities.

DPR coordinates these activities, when appropriate, with DWR, DBW, DFG, CDF, Butte County, CHP, volunteer organizations, and other groups and agencies.

The LOSRA is managed under the guidance of the LOSRA General Plan (GP), which was developed by the DPR in 1973 and is currently being updated. An amendment adopted in 1988 details additional development in the Lime Saddle area. The GP describes allowable recreational uses and intensities for various areas around the reservoir, such as Bidwell Canyon, Lime Saddle, Goat Ranch, and others. In compliance with the FERC Order of October 1, 1992, DWR prepared the Amended Recreation Plan (ARP) in 1993 as the recreation plan for the LOSRA. The ARP was adopted by the FERC Order of September 22, 1994 and superseded the 1966 Plan, Bulletin 117-6. DWR developed the ARP for the LOSRA to address public concerns associated with the recreation development associated with the project. The 1993 ARP describes a number of improvements and DWR commitments to construct specific facilities and take actions to address the fisheries and recreation needs at the project; additional improvements and actions deemed necessary by FERC were included in the September 22, 1994, Order. The 1993 ARP also detailed the timeframe for the completion of additional proposed recreational facilities. DWR acknowledges in the ARP that as the licensee, they are responsible for funding specific improvements. The ARP describes the fish and wildlife resources, facilities, local area, user patterns, operation of LOSRA and OWA facilities, economic considerations, recreation plan, and the fisheries management plan. The ARP puts forth recommendations for facility expansion and modification in light of these findings. These recommendations have since been implemented.

California Department of Fish and Game

DFG manages approximately 12,000 acres of land, or 17 percent of the total study area. Most of this area (11,200 acres) is located within the FERC Project boundary. DFG manages fish and wildlife habitat and associated recreational use for both surface water and dry lands within the OWA and the fish and wildlife habitat of the LOSRA. In addition, DFG manages and operates the Feather River Fish Hatchery. Figure 5.3-3 of the report for SP-L2, Land Management Study, illustrates the locations of DFG-managed lands, as well as facilities for which the agency is responsible within the study area. Most of the land area for which DFG provides day-to-day management is within the OWA and is located within the FERC Project boundary. The OWA includes Thermalito Afterbay and a wide swath of wildlife habitat straddling the Low Flow and High Flow Channel sections of the project south and west of the City of Oroville.

DFG manages the OWA, the wildlife and habitats of the LOSRA, and its other State-wide responsibilities under the California Fish and Game Code, Sections 1525–1530, and the California Fish and Game Commission's Hunting and Other Public Uses on State and Federal Lands California Regulations (DFG 2002). To ensure compatibility with the goals and uses of the Oroville Facilities within the LOSRA, DFG is also responsible for managing fish and wildlife resources and recreational activities pursuant to the Davis-Dolwig Act (Water Code Section 11917). Within the OWA, DFG strives to carry out management responsibilities as identified in the 1978 *Oroville Wildlife Area*

Management Plan (DFG 1978). DFG intends to revise the Management Plan in the near future.

Remote areas within the OWA that are accessible by road have been susceptible to illegal activities, such as dumping, fires, and lawless behavior. Consequently, some access restrictions have been implemented.

4.6.2.3 Local Entities

Butte County

All lands in the study area owned by Butte County are located outside the FERC Project boundary. County-owned properties generally reflect administrative uses for government services. In total, Butte County owns approximately 100 acres of land, which represents less than 1 percent of the study area and FERC Project boundary. Butte County has land management jurisdiction over approximately 21,300 acres of private lands within the study area, which represents approximately 31 percent of the entire study area. There are no private lands within the FERC Project boundary. All private development in Butte County is subject to the policies detailed in the Butte County GP and Zoning Ordinance.

The Butte County Zoning Ordinance is the regulatory mechanism that implements the County's land use designations listed in the Butte County GP. The zoning ordinance is a set of districts with different regulations on permitted uses, residential densities, lot sizes, signs, parking, and the intensity and placement of structures. The written text of the ordinance is accompanied by maps dividing the entire jurisdiction into zoning districts.

The majority of private lands under Butte County jurisdiction outside of and adjacent to the FERC Project boundary are designated Unclassified, consisting primarily of constrained areas that require minimal oversight. Butte County's land use designations are summarized in Table 5.4-1 of the report for SP-L2, Land Management Study. For each designation, this table describes both primary and secondary use and identifies the implementing zoning designations. The County's zoning designations, aggregated into categories, are illustrated in Figures 5.4-1a through 5.4-1c, Butte County Zoning, of the report for SP-L2, Land Management Study.

City of Oroville

The City of Oroville owns a limited number of properties in the study area, all of which are located outside of the FERC Project boundary. City-owned properties typically represent uses pertaining to government services and recreation. In total, the City owns roughly 150 acres of land in the study area.

Part of the study area is located within the boundary of the City of Oroville. These areas are located south of Lake Oroville and west of Saddle Dam and include the shoreline of Lake Oroville between the Saddle Dam and the northeastern edge of the Oroville Dam Spillway, the Diversion Pool, Thermalito Forebay, Thermalito Afterbay, the LFC of the

Feather River, and the OWA. In total, roughly 1,100 acres (or 2 percent of the total study area) are located within the City limits. No lands owned by the City of Oroville are located within the FERC Project boundary. Figure 5.4-2, City of Oroville Zoning, of the report for SP-L2, Land Management Study, illustrates the City of Oroville zoning within the City as it relates to the study area.

All development and activity within the City of Oroville is subject to the policies outlined in the City's GP and Zoning Ordinance. The objectives detailed in the GP pertaining to land use serve as a framework within which the City makes decisions relating to activities and developments within the study area that fall under its authority. The policies detailed in the plan represent the city's adopted commitments to actions that are intended to implement the community's broader objectives.

The Land Use Element of the Oroville GP designates areas near the project facilities as "Medium Density Residential" and "Parks." These land use designations are described in the report for SP-L2, Land Management Study.

Oroville GP policies that relate to the operation and management of Lake Oroville generally include enhancement of recreational and biological resources at Lake Oroville, as well as reducing potential flood and seismic hazards. Policies that specifically mention the Oroville Facilities are listed in Table 5.4-3 of the report for SP-L2, Land Management Study, organized by element of the Oroville GP.

Feather River Recreation and Park District

Another local entity that owns and administers lands in the study area is the FRRPD, which was established in 1953 and provides a variety of park and recreational services to residents of southeast Butte County. FRRPD holdings in the study area, which include Riverbend Park located west of SR 70 at Montgomery Street consisting of 50 owned and 100 DFG leased acres as well as roughly 18 owned acres and 34 acres leased from DWR for Nelson Avenue Park.

Other Local Districts/Agencies

There is also a set of public agencies, including local districts, that own property in the study area. Aside from the FRRPD described above, the following entities own land within the study area but outside the FERC Project boundary:

- Sacramento and San Joaquin Drainage District;
- County Board of Education;
- County Housing Authority;
- Thermalito Irrigation District;
- Richvale Irrigation District;

- Oroville Area Public Utility District;
- Oroville Elementary School District;
- Oroville Union High School District;
- Thermalito Elementary School District;
- Biggs-West Gridley Water District;
- Western Canal Water District; and
- South Feather Water and Power Agency.

In total, these entities own approximately 156 acres of land in the study area, representing less than 1 percent of the study area total.

4.6.2.4 Private

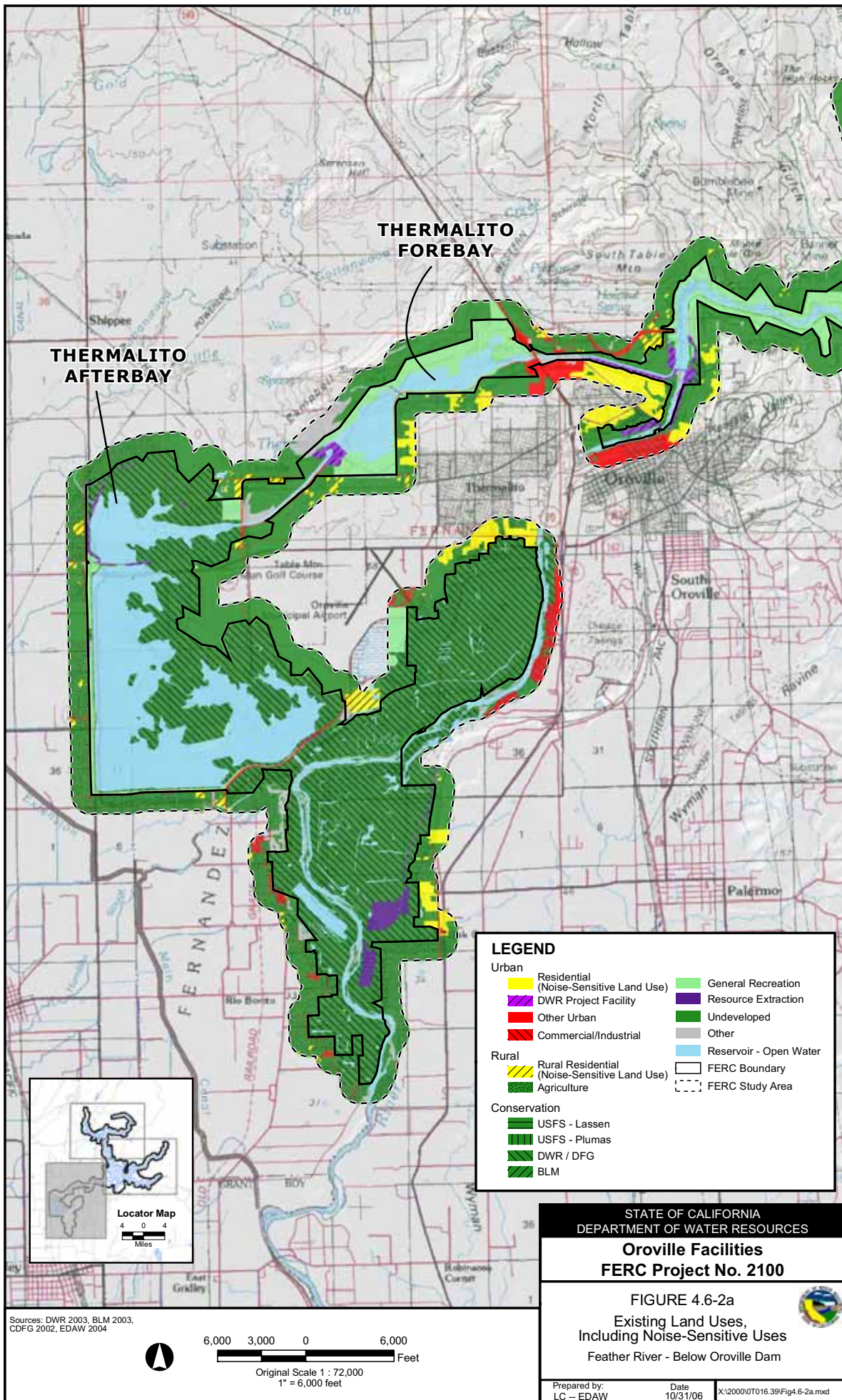
There are no private ownership interests within the FERC Project boundary; however, land in the study area (including land outside the FERC Project boundary) is predominantly owned by public agencies (approximately 69 percent) and private interests who own approximately 29 percent of lands in the study area. One of the larger private landowners in the study area is Pacific Gas and Electric Company (PG&E). This entity primarily uses lands in the study area for transmitting power. In general, management of private lands must comply with current land use planning guidelines (i.e., general plans) and regulations (i.e., zoning ordinances) of Butte County and the City of Oroville.

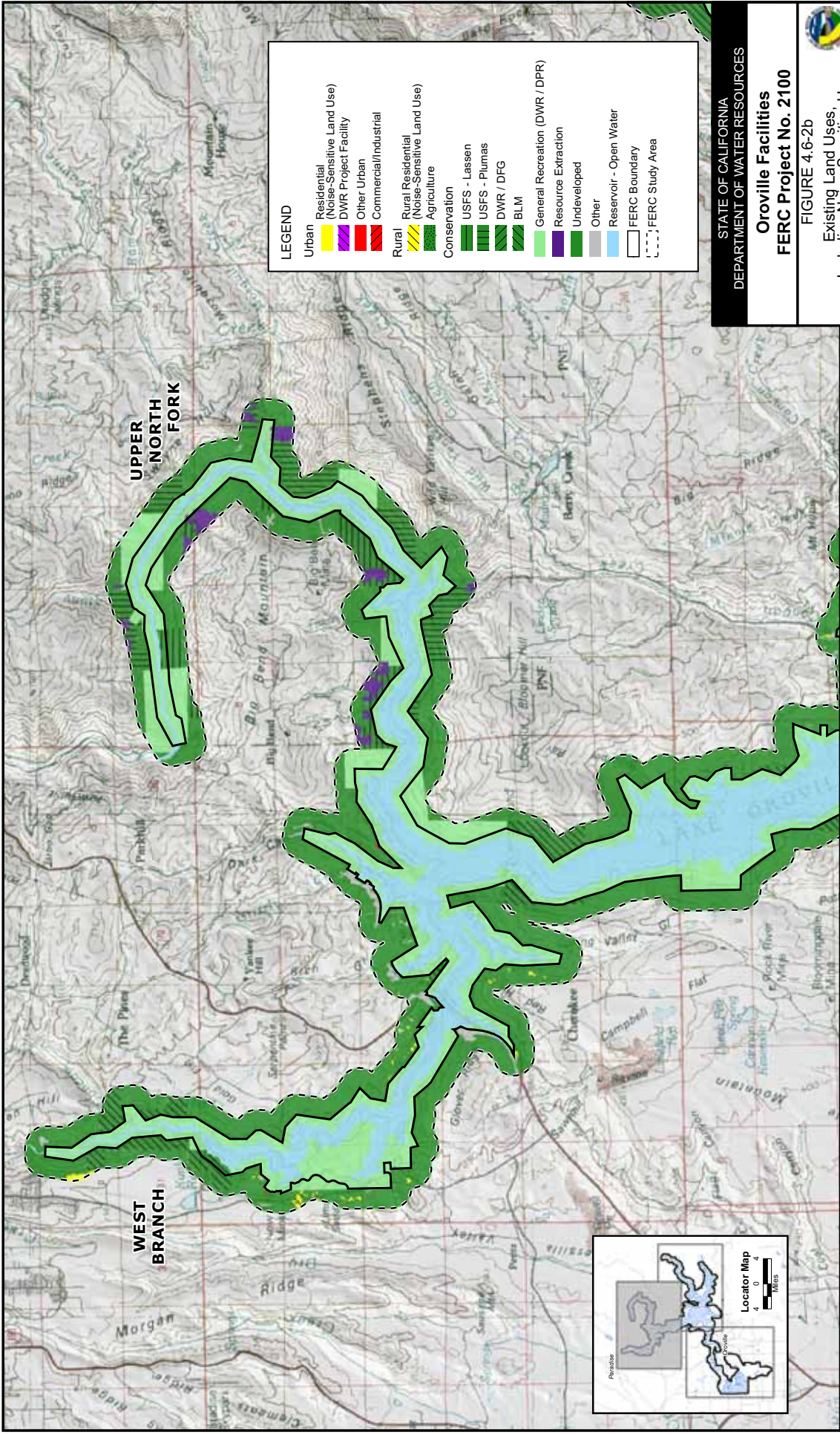
4.6.2.5 Other

The remaining lands in the study area are either State or County road rights-of-way or areas without an official parcel number, which are often attributed to public trust lands such as the river channel. Because these lands do not reflect meaningful ownership information, they have been classified as “Other.” There are approximately 1,200 acres of other-owned land, representing nearly 2 percent of the study area total.

4.6.3 Existing Land Uses

The section is based on information in the report for SP-L1, Land Use Study, developed using available GIS data for the study area. Existing land uses in the study area have been organized into eight major land use classifications as shown in Table 5.8-4 of the report for SP-L1, which summarizes the respective major land use classifications within the FERC Project boundary and in the study area. Figures 4.6-2a, 4.6-2b, and 4.6-2c illustrate the existing land use patterns in the study area.





LEGEND

Urban

Residential (Noise-Sensitive Land Use)

DWR Project Facility

Other Urban

Commercial/Industrial

Rural

Rural Residential (Noise-Sensitive Land Use)

Agriculture

Conservation

USFS - Lassen

USFS - Plumas

DWR / DFG

BLM

General Recreation (DWR / DPR)

Resource Extraction

Undeveloped

Other

Reservoir - Open Water

FERC Boundary

FERC Study Area

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

Oroville Facilities
FERC Project No. 2100

FIGURE 4.6-2b
Existing Land Uses,
Including Noise-Sensitive Uses
Lake Oroville - North

Public Document

Prepared by:

Date

X:\2000\0716.39\Fig4.6-2b.mxd

10/31/06

LC - EDW

6,000 3,000 0 6,000 Feet

Original Scale 1" = 72,000 feet
1" = 6,000 feet

Paradise

Oroville

Locator Map

0 4 Miles

Sources: DWR 2003, BLM 2003,
CDFG 2002, EDW 2004